

CLAIMS

What is claimed is:

1. A direct conversion receiver (DCR) comprising:
a pair of quadrature conversion paths, each of said quadrature conversion paths receiving an RF input signal and converting said RF input signal to a digital baseband signal, said each quadrature conversion path comprising:
a mixer mixing said RF input signal with a carrier phase signal,
an analog filter receiving a quadrature baseband signal from said multiplier and providing a filtered baseband signal,
an analog-to-digital converter (ADC) converting a quadrature baseband component to a digital baseband signal,
a 5th order elliptical filter filtering said quadrature baseband component, and
a phase equalizer compensating for phase distortion arising in said analog filter; and
a baseband processor receiving quadrature digital baseband outputs from said pair of quadrature conversion paths and providing digital information therefrom.

2. A DCR as in claim 1 wherein each phase equalizer is a second order all pass digital phase equalizer.

3. A DCR as in claim 2 wherein the phase equalizer has a transfer function defined by

$$H_{eq}(z) = \frac{b_0 + b_1 z^{-1} + b_2 z^{-2}}{a_0 + a_1 z^{-1} + a_2 z^{-2}}$$

where $a_0=b_2$, $a_1=b_1$, $a_2=b_0$.

4. A DCR as in claim 3 wherein each 5th order elliptical filter receives the digital output of the ADC and provides said digital baseband component to the phase equalizer.

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1 5. A DCR as in claim 3 wherein each 5th order elliptical filter receives the
2 filtered baseband signal from the analog filter and provides the quadrature baseband
3 component to the ADC, the ADC output being provided to the phase equalizer.

1 6. A direct conversion receiver (DCR) comprising:
2 a pair of quadrature conversion paths, each of said quadrature conversion
3 paths receiving an RF input signal and converting said RF input signal to a digital
4 baseband signal, said each quadrature conversion path comprising:
5 a mixer mixing said RF input signal with a carrier phase signal,
6 an analog filter receiving a quadrature baseband signal from said multiplier
7 and providing a filtered baseband signal,
8 an analog-to-digital converter (ADC) converting a quadrature baseband
9 component to a digital baseband signal,
10 a 5th order elliptical digital filter receiving said quadrature baseband
11 component and providing a filtered digital baseband component, and
12 a phase equalizer compensating said filtered digital baseband component for
13 phase distortion arising in said analog filter; and
14 a baseband processor receiving quadrature digital baseband outputs from said
15 pair of quadrature conversion paths and providing digital information therefrom.

1 7. A DCR as in claim 6 wherein each phase equalizer is a second order all pass
2 digital phase equalizer.

1 8. A DCR as in claim 7 wherein the phase equalizer has a transfer function
2 defined by

3
$$H_{eq}(z) = \frac{b_0 + b_1 z^{-1} + b_2 z^{-2}}{a_0 + a_1 z^{-1} + a_2 z^{-2}}$$

4 where $a_0=b_2$, $a_1=b_1$, $a_2=b_0$.

1 9. A direct conversion receiver (DCR) comprising:
2 a pair of quadrature conversion paths, each of said quadrature conversion
3 paths receiving an RF input signal and converting said RF input signal to a digital
4 baseband signal, said each quadrature conversion path comprising:
5 a mixer mixing said RF input signal with a carrier phase signal,
6 an analog filter receiving a quadrature baseband signal from said multiplier
7 and providing a filtered baseband signal,
8 a 5th order elliptical filter filtering said filtered baseband signal and providing
9 a quadrature baseband component,
10 an analog-to-digital converter (ADC) converting said quadrature baseband
11 component to a digital baseband signal, and
12 a phase equalizer compensating said digital baseband signal for phase
13 distortion arising in said analog filter; and
14 a baseband processor receiving quadrature digital baseband outputs from said
15 pair of quadrature conversion paths and providing digital information therefrom.

1 10. A DCR as in claim 9 wherein each phase equalizer is a second order all pass
2 digital phase equalizer.

1 11. A DCR as in claim 10 wherein the phase equalizer has a transfer function
2 defined by

$$H_{eq}(z) = \frac{b_0 + b_1 z^{-1} + b_2 z^{-2}}{a_0 + a_1 z^{-1} + a_2 z^{-2}}$$

4 where $a_0=b_2$, $a_1=b_1$, $a_2=b_0$.